

**Ontario Ministry of the Environment
Summary Report of Activities to Manage
West Nile Virus 2005**

April 2007

Protecting our environment.



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Introduction

The Ministry of the Environment (MOE) supports health authorities in managing the risk of West Nile Virus (WNV). MOE provides technical and regulatory expertise to the Ministry of Health and Long-Term Care (MOHLTC), public health officials and other stakeholders on the control of mosquitoes as part of an integrated strategy to control the spread of WNV.

MOE Outreach – Technical Expertise, Public Awareness and Education

A fundamental part of Ontario's WNV program is raising awareness and educating the public about WNV. MOE supported health units by reviewing material and attending public meetings. MOE fact sheets were updated and posted on the Ministry's website. MOE also participated on national and provincial advisory committees and responded to requests for information on the use of pesticides from pest control operators, licensed exterminators and individuals. These activities increased awareness of MOE's regulatory requirements for conducting mosquito control programs. MOE visited 17 sites during larvicide to determine if licensed exterminators were complying with pesticide label directions and permit conditions so that larvicides did not pose a threat to the environment or to human health. Appropriate action was taken to address any concerns identified (i.e. unauthorized persons applying larvicide, lack of appropriate safety/protective equipment, treatment of unauthorized catch basins and treatment of dry catch basins).

Licences and Permits

An exterminator must hold a valid Mosquito/Biting Flies (MBF) licence and obtain a permit from the MOE to apply larvicides to water for the control of mosquitoes. In 2005, 158 MBF licences were issued by MOE for a total of 858 active MBF licence holders.

In 2005, MOE authorized only three larvicides for use in managing WNV: *Bacillus thuringiensis israelensis* (*Bti*); methoprene; and a new product, *Bacillus sphaericus* (*B. sphaericus*). Methoprene can be used in the water contained in curbside catch basins and sewage lagoons, while *Bti* may be applied to ponds, ditches and other stagnant surface water. *B. sphaericus* can be used for catch basins, surface waters and sewage lagoons.

These larvicides have been extensively reviewed and approved for use by the Pest Management Regulatory Agency (PMRA) of Health Canada. *Bti*, a naturally occurring soil bacterial spore, is a biological larvicide registered in Canada. Safety evaluations of *Bti* application for larval control have shown no risk to wildlife, other non-target species or to human health. *B. sphaericus* is also a bacteria and can be used in environmentally sensitive areas (ESAs) since it is unlikely to affect non-target organisms. Methoprene is an insect growth regulator that prevents mosquito larvae from developing into adults and has been used extensively in mosquito control programs. Safety evaluations of methoprene have shown that it does not cause significant risks to wildlife, people, or the environment at levels shown to be effective in preventing mosquito larvae from developing into adults.

MOE updated and posted the 2005 Permit Applicant guides, (for municipal programs and private property treatments) to include the use of *B. sphaericus*.

Specific changes to the permit applicant guides included:

- revising the Sensitive Area and Species Protocol to include the use of *B. sphaericus*
- providing MNR contacts for health units to request information on sensitive areas, critical fish habitat, fish sanctuaries and endangered species
- revising procedures for post-larviciding monitoring for methoprene by removing the identification of emerging adults when assessing emergence

In Ontario, 22 of 36 health units used larvicides and 310 permits (69 municipal and 241 private property) were issued by MOE. Appendix 1 provides a summary of the 2005 permits.

Permit holders are required to provide year end summary data on the use of larvicides to MOE. Data submitted between 2003 and 2005 on the quantities of larvicides used and the amount of area treated is summarized in Appendix 2. The bar graphs illustrate the following trends:

- A small increase in the number of municipal and private catch basins treated with larvicide from 2003 to 2005.
- An increase in the amount of surface water treated with *Bti* on private properties from 2003 to 2005.
- A decrease in the amount of municipal surface water treated with *Bti* from 2003 to 2005

Monitoring and Scientific Studies

In 2005, MOE continued monitoring of drinking water and surface water for methoprene and its metabolites. A total of 31 surface water samples were taken at 12 locations in southern Ontario as part of the Provincial Water Quality Monitoring Network (PWQMN). Watersheds with a high percent of urban land use were selected to maximize the potential of finding methoprene concentrations in surface water. As well, through the Drinking Water Surveillance Program (DWSP), a total of 92 raw and treated water samples were analysed from 35 water treatment plants from May to September, 2005 around the Golden Horseshoe. Analytical results showed no presence of methoprene or its metabolites in 2005 samples (detection limit 5ng/L). To date, monitoring through PWQMN and DWSP have not identified these substances in collected samples.

Halton and Peel Health Units in partnership with MOE compared the effectiveness of controlling mosquito larvae with methoprene ingots in recently cleaned-out and debris-filled catch basins with untreated controls. In Peel region, (catch basins vacuumed out) preliminary results showed that the ingot was effective and in Halton region, (catch basins with debris) initial findings indicated that the ingot was very successful in inhibiting larval emergence. Further assessment of the collected data is needed to determine:

- Correlations between catch basin water chemistry and emergence data
- Differences between Halton and Peel catch basins that may contribute to ingot efficacy (i.e. rainfall, catch basin location and contents)
- Statistical significance of data
- Identity of adult mosquito at the species level

A long-term study on the effects of *Bti* use on biota of wetlands is ongoing. In 2005, additional studies were conducted using six experimental ponds at Western University.

In March, 2005, a research study investigating the effects of methoprene on the development of amphibians was completed. The study report is undergoing peer review. Preliminary findings indicated no developmental abnormalities of frogs when exposed to methoprene concentrations between 100 and 2000 ug/L.

MOE continues to examine the risk of WNV related to storm water management ponds (SWM ponds) since these are potential mosquito breeding sites and may be located in urban areas. A multi-jurisdictional working group is reviewing the data collected from the monitoring of SWM ponds to support recommendations to reduce the risk of WNV in operating and designing SWM ponds.

Conclusion

The MOE continued to provide regulatory and technical advice on pesticides as part of an integrated mosquito control strategy for WNV in 2005. Regional outreach activities and support provided to health units contributed to an effective and well managed WNV program for Ontario.

Appendix 1

Summary of Permit Data and Larvicide Usage for 2005 West Nile Virus Program

Methoprene Permit Summary

Methoprene	No. of Permits Issued*	No. of Permits Used*	Proposed No. of Catch basins Treated	Actual No. of Catch basins Treated	Actual Quantity of Altosid Pellets Used (kg)	Actual Quantity of Altosid briquettes Used (# ingots)
Municipal	36	31	911,007	767,390	1,643.1	39,210
Private	132	126	32,497	29,607	51.9	7,446
ORC	10	10	2,322	1,419	0.7	1,106
MTO	13	12	8,804	4,788	1.3	4,182
TOTAL	191	179	954,630	803,204	1,697	51,944

* Permits may include the use of multiple products including *B. sphaericus*

***Bacillus thuringiensis* var. *israelensis* (*Bti*) Permit Summary**

<i>Bti</i>	No. of Permits Issued*	No. of Permits Used*	Actual Quantity Used (kg)	Actual Quantity Used (L)
Municipal	22	18	1,550.5	39.5
Private	72	42	1,889.5	0.9
ORC	0	0	0	0
MTO	12	2	135.3	0
TOTAL	106	62	3,575.34	40.4

* Permits may include the use of multiple products including *B. sphaericus*

***Bacillus sphaericus* (*B. sphaericus*) Permit Summary**

<i>B. sphaericus</i>	No. of Permits Issued	No. of Permits Used	Actual Quantity Used in Catch Basins (kg)	Actual Quantity Used in Surface Water (kg)
Municipal	9	9	40.8	118.0
Private	4	4	7.1	64.3
ORC	0	0	0	0
MTO	0	0	0	0
Total	13	13	47.9	182.3

Summary of Surface Area Treated with *Bti* or *B. sphaericus*

	Proposed Size of Treatment Area (ha)	Actual Size of Treatment Area (ha)
Municipal	2929.8	258.9
Private	413.1	302.3
ORC	0	0
MTO	35.3	4.0
Total	3378.2	565.2

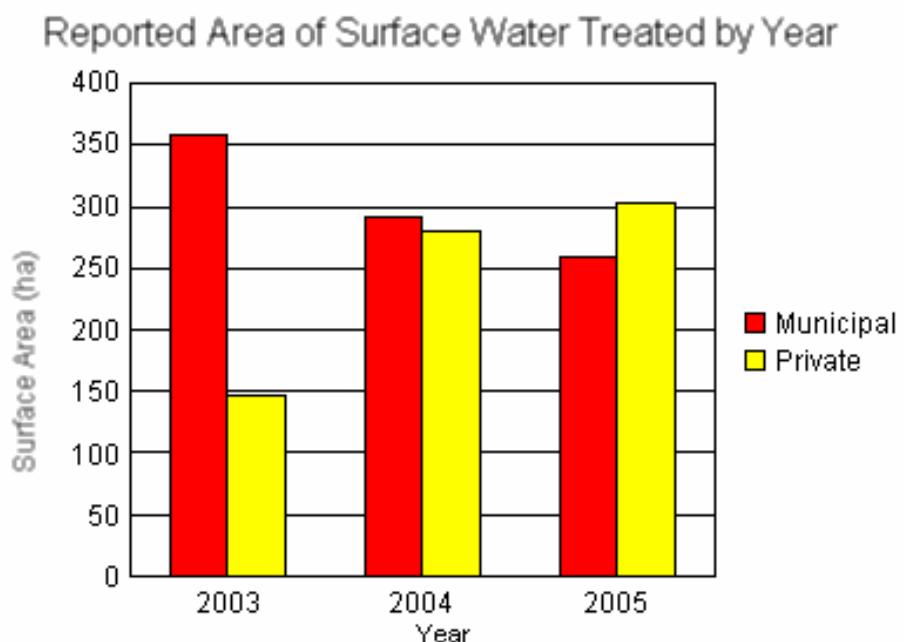
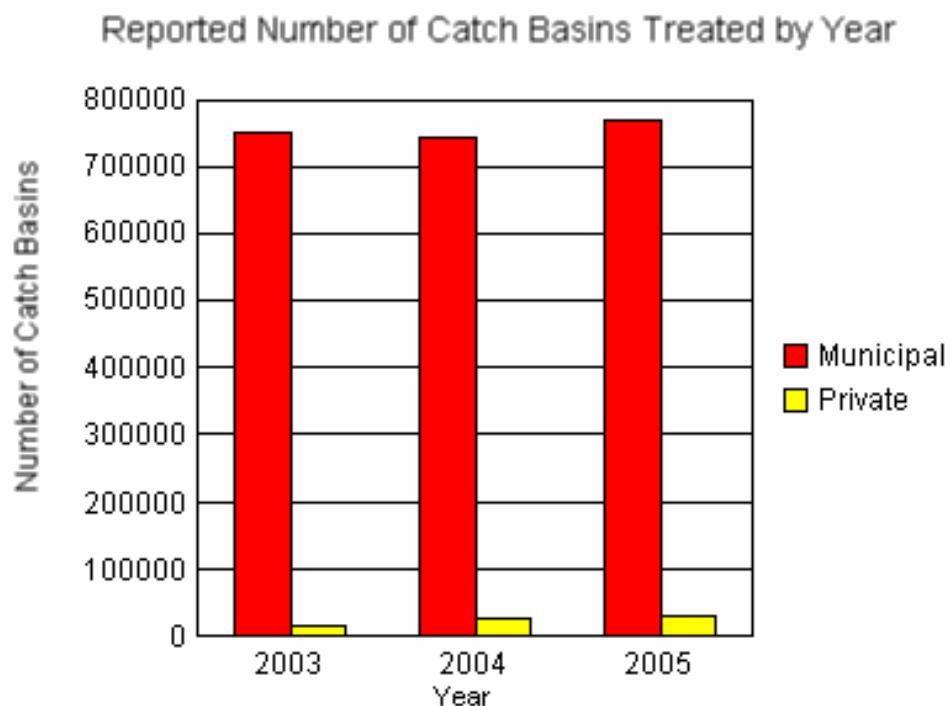
Summary of Methoprene, *Bti* and *B. sphaericus* Use in Municipal Programs by Health Unit

Health Unit/MOE Region	Max. No. of Catch basins (unless noted) treated with Methoprene or <i>B. sphaericus</i>	No. of Treatments with Methoprene Pellets per Catch basin/Quantity used (kg)	<u>Quantity of Methoprene briquettes used</u>	Quantity <i>B. sphaericus</i> used (kg)	Area Treated with <i>Bti</i> or <i>B.sphaericus</i> (ha)	Quantity of <i>Bti</i> Used (kg unless noted)
Durham Region Health Dept. (CR)	54309	3/114.1	99	0	8.91	133.6
Halton Region Health Dept. (CR)	41296	4/114.16	17	0	100	332.6
	18 holding tanks	4/8.28	0	0	0	0
Regional Municipality of Peel Health Dept. (CR)	81012	4/214.64	1942	24.18	0.44	2.5
Toronto Public Health (CR)	109554	2/123.19	21557	0	0.23	4.66
York Region Health Services Dept. (CR)	78186	4/214.23	854	38	9.11	2.5L
Brant County Health Unit (WCR)	13341	2/18.4	0	13.2	1.32	0.04
City of Hamilton Public Health & Community Services Dept. (WCR)	38221	4/106.54	0	0	62.2	1007.6
Haldimand-Norfolk Health Unit (WCR)	7389	4/20.5	0	0	2.43	24.3
Regional of Waterloo Public Health (WCR)	29782	5/88.5	0	0	8	7.95
Regional Niagara Public Health Dept. (WCR)	41893	4/110.87	0	8.94	0.65	2.6

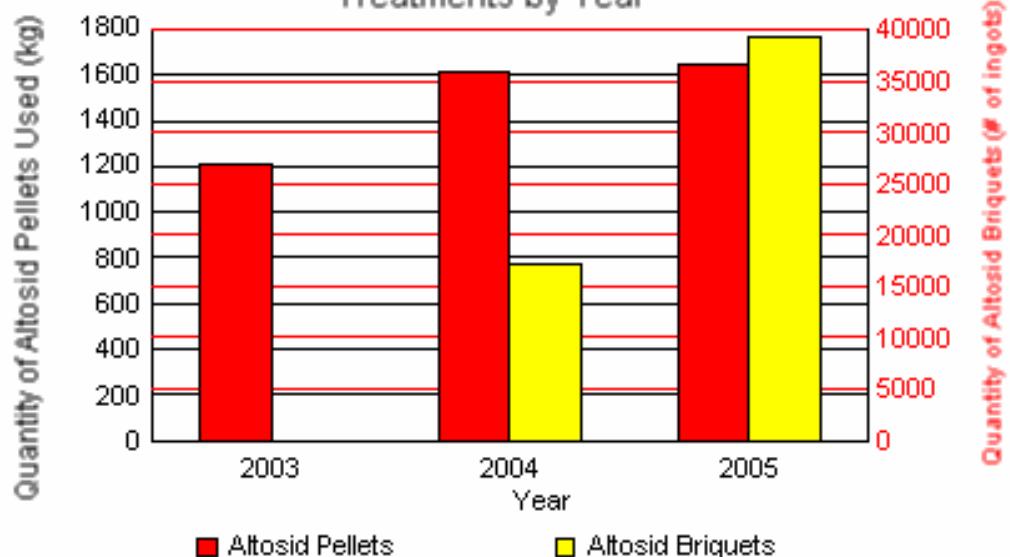
Health Unit/MOE Region	Max. No. of Catch basins (unless noted) treated with Methoprene or <i>B. sphaericus</i>	No. of Treatments with Methoprene Pellets per Catch basin/Quantity used (kg)	<u>Quantity of Methoprene briquettes used</u>	Quantity <i>B. sphaericus</i> used (kg)	Area Treated with <i>Bti</i> or <i>B.sphaericus</i> (ha)	Quantity of <i>Bti</i> Used (kg unless noted)
Wellington-Dufferin-Guelph Health Unit (WCR)	20612	4/69.6	83	1.71	1.19	5.7
City of Ottawa Public Health and Long-term Care Branch (ER)	101243	3/149.75	0	10	31.71	28.72L
Hastings and Prince Edward Counties Health Unit (ER)	7092	4/9.23	3563	0	0.288	5.06
Peterborough County-City District Health Unit (ER)	11533	3/23.6	0	0	17.22	6.06L
Renfrew County and District Health Unit (ER)	0	0	0	0	0	0
Chatham-Kent Public Health Services (SWR)	11454	2/14	0	0	0	0
Elgin St Thomas Health Unit (SWR)	4818	2/6.68	0	0.2	0.038	0.33
County of Lambton Community Health Services Dept. (SWR)	14078	3/42.5	0	0	0	0
Middlesex-London Health Unit (SWR)	31151	4/82.56	0	15.26	4.80	23.44

Health Unit/MOE Region	Max. No. of Catch basins (unless noted) treated with Methoprene or <i>B. sphaericus</i>	No. of Treatments with Methoprene Pellets per Catch basin/Quantity used (kg)	<u>Quantity of Methoprene briquettes used</u>	Quantity <i>B. sphaericus</i> used (kg)	Area Treated with <i>Bti</i> or <i>B.sphaericus</i> (ha)	Quantity of <i>Bti</i> Used (kg unless noted)
County of Oxford Dept. of Public Health and Emergency Services (SWR)	7785	0	7771	0.2	0	0
Perth District Health Unit (SWR)	6771	3/8.69	190	0	0.025	0.17
Simcoe County Health Unit (SWR)	18767	3/29.36	3134	0	0	0
Windsor-Essex County Health Unit (SWR)	37103	4/73.7	0	47.1	10.36	2.25L
Total	767390	1643.07	39210	158.79	258.92	1550.55kg & 39.53L

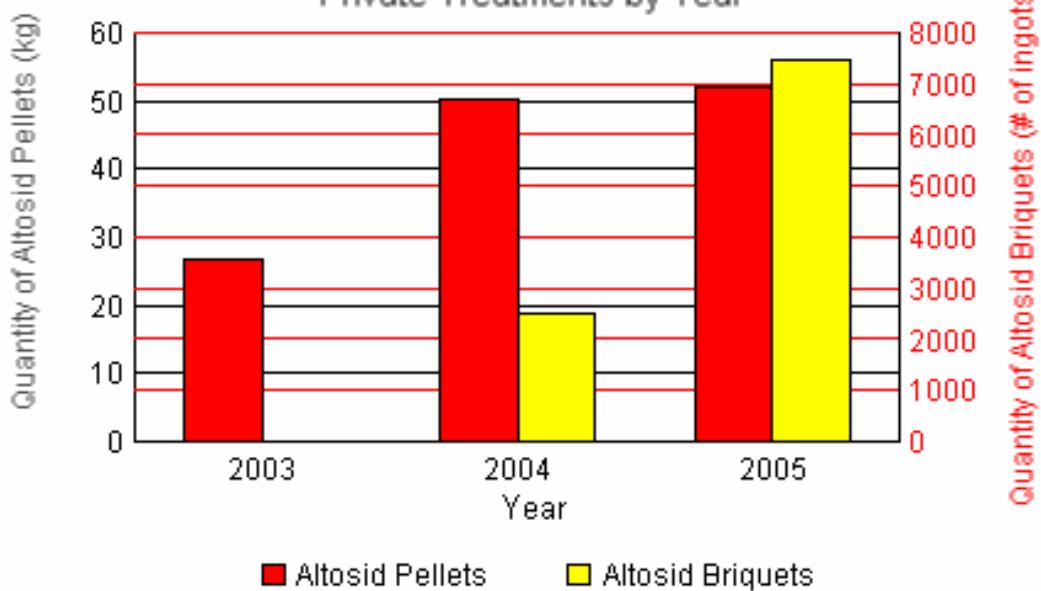
Appendix 2 -Graphical Comparison of Treatment Area and Larvicide Usage From 2003 to 2005 in Ontario



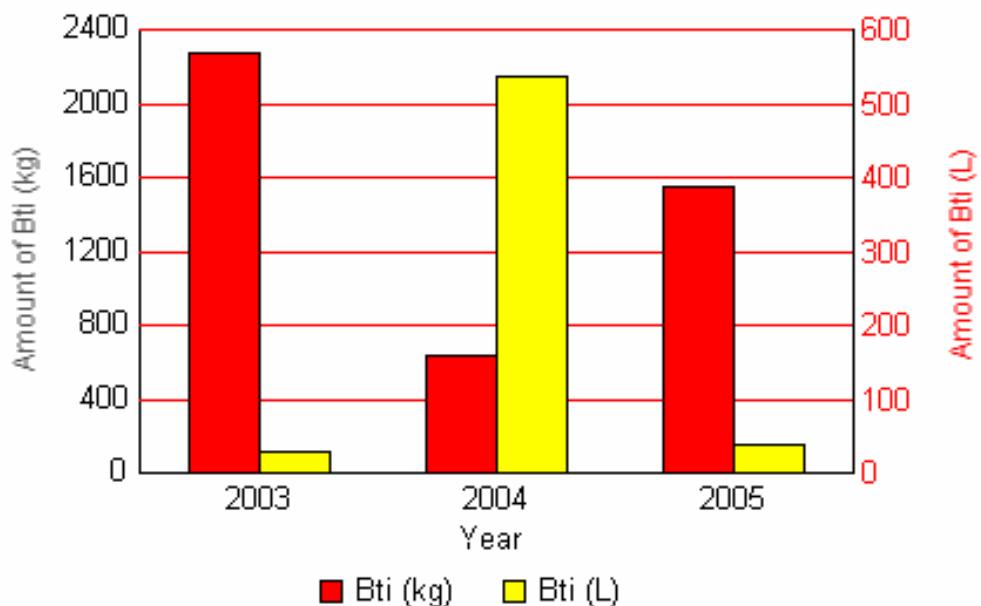
Reported Amount of Methoprene Used for Municipal Treatments by Year



Reported Amount of Methoprene Used for Private Treatments by Year



Reported Amount of Bti Used for Municipal Treatments by Year



Reported Amount of Bti Used for Private Treatments by Year

